

Name: \_\_\_\_\_

## at1118paper: Complete the Square (v420)

### Example

By completing the square, find both solutions to the given equation:

$$x^2 - 60x = -576$$

Add  $\left(\frac{-60}{2}\right)^2$ , which equals 900, to both sides of the equation.

$$x^2 - 60x + 900 = 324$$

Factor the left side.

$$(x - 30)^2 = 324$$

Undo the squaring. We need to consider both  $\pm\sqrt{324}$ .

$$x - 30 = -18$$

or

$$x - 30 = 18$$

$$x = -48$$

or

$$x = -12$$

### Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 32x = -240$$

$$x^2 - 32x + 256 = 16$$

$$(x - 16)^2 = 16$$

$$x - 16 = \pm 4$$

$$x = 12 \quad \text{or} \quad x = 20$$

### Question 2

By completing the square, find both solutions to the given equation:

$$x^2 + 46x = -273$$

$$x^2 + 46x + 529 = 256$$

$$(x + 23)^2 = 256$$

$$x + 23 = \pm 16$$

$$x = -39 \quad \text{or} \quad x = -7$$

### Question 3

By completing the square, find both solutions to the given equation:

$$x^2 - 46x = 627$$

$$x^2 - 46x + 529 = 1156$$

$$(x - 23)^2 = 1156$$

$$x - 23 = \pm 34$$

$$x = -11 \quad \text{or} \quad x = 57$$

### Question 4

By completing the square, find both solutions to the given equation:

$$x^2 - 18x = 88$$

$$x^2 - 18x + 81 = 169$$

$$(x - 9)^2 = 169$$

$$x - 9 = \pm 13$$

$$x = -4 \quad \text{or} \quad x = 22$$

### Question 5

By completing the square, find both solutions to the given equation:

$$x^2 + 18x = 1008$$

$$x^2 + 18x + 81 = 1089$$

$$(x + 9)^2 = 1089$$

$$x + 9 = \pm 33$$

$$x = -42 \quad \text{or} \quad x = 24$$

### Question 6

By completing the square, find both solutions to the given equation:

$$x^2 + 30x = -104$$

$$x^2 + 30x + 225 = 121$$

$$(x + 15)^2 = 121$$

$$x + 15 = \pm 11$$

$$x = -26 \quad \text{or} \quad x = -4$$